

# Claims

- [c1] 1. A computer-implemented method to facilitate failure modes and effects analysis (FMEA) of one or more components of a system, wherein an FMEA form is generated to indicate the FMEA, the method comprising:
- displaying with a graphical user interface used by a computer a sequential order of completion of steps for a number of graphical representations which are to be completed by an FMEA analyst and received by the graphical user interface in sequential order to facilitate generating the FMEA form; and
- receiving the graphical representations according to the sequential order of completion, wherein receiving the graphical representations comprises receiving a pictorial diagram of component interactions for one or more components comprising the system such that a visual display of the component interactions is received to facilitate generating the FMEA form, and wherein a first graphical representation is received and each subsequently received graphical representation is completed based in part upon the visual display provided by the first graphical representation such that each graphical representation builds upon the first graphical represen-

tation to facilitate generating the FMEA form.

- [c2] 2. The method of claim 1 further comprising displaying a process indicator to indicate completion of each graphical representation in the sequential order, wherein the process indicator tracks receipt of each graphical representation for use in indicating completion of the graphical representation.
- [c3] 3. The method of claim 1 wherein receiving the first graphical representation comprises receiving a boundary diagram to pictorially diagram the component interactions of the components comprising the system such that the boundary diagram facilitates generating the FMEA form, wherein the boundary diagram identifies physical and non-physical interactions between the components comprising the system.
- [c4] 4. The method of claim 3 further comprising receiving textual inputs naming each one of the components comprising the system and graphically displaying the names with an interaction of the components, wherein the interaction is graphically displayed by drawing an interaction line between each component to pictorially diagram the system interactions.
- [c5] 5. The method of claim 4 further comprising indicating

the interaction line with double arrows to indicate a physical interface and a single arrow to indicate non-physical interaction, wherein each non-physical interaction includes a textual description.

- [c6] 6. The method of claim 3 further comprising receiving an interface matrix diagram after receiving the boundary diagram to pictorially diagram the component interactions of the components comprising the system such that the interface matrix is used in combination with the boundary diagram to facilitate generating the FMEA form, wherein the interface matrix diagram includes interface valuation data which identifies a strength for each interaction determined by the boundary diagram.
- [c7] 7. The method of claim 6 further comprising receiving a numerical strength input for each interaction to indicate the strength of the interaction.
- [c8] 8. The method of claim 7 further comprising indicating the numerical strength input with a value indicating the strength for each interaction as one of necessary to functionality, beneficial but not absolutely necessary for functionality, not necessary to functionality, causing negative effects but not preventing functionality, and requiring prevention to achieve functionality.

- [c9] 9. The method of claim 8 wherein the interface matrix includes a four quadrant box for each component comprising the system and arranges the components within the interface matrix such that one box is provided to match each component with every other component comprising the system, and wherein the method further comprises positioning the numerical strength input within one quadrant of the four quadrants of the four quadrant boxes to indicate a type of interaction for the component.
- [c10] 10. The method of claim 9 further comprising positioning the numerical strength input in a first quadrant to indicate physical touching, a second quadrant to indicate energy transfer, a third quadrant to indicate information exchange, and a fourth quadrant to indicate material exchange.
- [c11] 11. The method of claim 6 further comprising receiving a parameter diagram after receiving the boundary diagram and the interface matrix diagram to pictorially diagram the component interactions of the components comprising the system such that the parameter diagram is used in combination with the boundary diagram and the interface matrix to facilitate generating the FMEA form, wherein the parameter diagram includes textual descriptions of noise factors, inputs, design controls, and out-

puts to indicate influences of potential failure for the system based on the interactions provided by the boundary diagram and the strength for each interaction provided by the interface matrix.

- [c12] 12. The method of claim 11 further comprising receiving noise factors for the group comprising place-to-place variation, external conditions of usage, internal conditions of usage and changes in dimension to indicate influences of potential failure for the system.
- [c13] 13. The method of claim 12 further comprising receiving outputs from the group of ideal function and errors states to indicate influences of potential failure for the system.
- [c14] 14. The method of claim 13 wherein the FMEA form includes an item/function textual entry, a potential failure mode textual entry, a potential effects of failure textual entry, a potential cause of failure textual entry, a current designs controls prevention textual entry, a current design controls detection textual entry, and a recommended action textual entry, and the method further comprises generating the FMEA form by each of entering the item/function textual entry based upon reviewing the boundary diagram and the parameter diagram, entering the potential effects of failure textual entry based upon

reviewing the parameter diagram, entering the potential cause of failure textual entry based on reviewing interface matrix diagram and the parameter diagram, entering the current design controls prevention based on reviewing the parameter diagram, entering the current design controls detection textual entry based on reviewing the parameter diagram, and entering the recommended action textual entry base on reviewing the parameter diagram.

[c15] 15. The method of claim 14 further comprising revising the generated FMEA form based on receiving an interface checklist diagram, wherein the interface checklist diagram includes noise factors from the parameter diagram and requires a number of checkmarks for each noise factor in one or more categories from the group comprising the error states provided by the parameter diagram, noise factor management strategies, the ideal functions provided by the parameter diagram, and design controls provided by the parameter diagram such that the FMEA form is revised for each noise factor which fails to include one or more checkmarks.

[c16] 16. A computer-implemented method to generate a failure modes and effects analysis (FMEA) form for one or more components of a system, the method comprising: providing a graphical user interface for use with a com-

puter, wherein the graphical user interface provides a number of data entry fields for an item/function textual entry, a potential failure mode textual entry, a potential effects of failure textual entry, a severity numerical entry, a classification textual entry, a potential cause of failure textual entry, a frequency of occurrence numerical entry, a current designs controls prevention textual entry, a current design controls detection textual entry, a detection numerical entry, a risk prioritization numerical entry, a recommended action textual entry, a responsibility textual entry, an actions taken textual entry, a revised severity numerical entry, a revised frequency of occurrence numerical entry, a revised detection numerical entry, and a revised risk prioritization numerical entry to be inputted with data for generating the FMEA form; displaying with the graphical user interface a sequential order of completion of steps for a number of graphical representations which are to be completed by an FMEA analyst and received by the graphical user interface in sequential order to facilitate generating the FMEA form; receiving the graphical representations according to the sequential order of completion, wherein receiving the graphical representations comprises receiving a pictorial diagram of component interactions for one or more components comprising the system such that a visual display of the component interactions is received to fa-

cilitate generating the FMEA form, and wherein a first graphical representation is received and each subsequently received graphical representation is completed based in part upon the visual display provided by the first graphical representation such that each graphical representation builds upon the first graphical representation to facilitate generating the FMEA form; and inputting data into each of the entries provided by the graphical user interface after receiving the graphical representation according to the sequential order of completion.

[c17] 17. A computer-implemented method to facilitate failure modes and effects analysis (FMEA) of one or more components of a system, wherein an FMEA form is generated to indicate the FMEA, the method comprising:  
displaying with a graphical user interface used by a computer a sequential order of completion of steps which are to be completed by an FMEA analyst in sequential order to facilitate generating the FMEA form;  
completing the steps in sequential order; and  
generating the FMEA form upon completion of a last step.

[c18] 18. The method of claim 17 wherein the sequential order of completion of steps comprises in order providing a boundary diagram graphical representation, providing an



interface matrix diagram graphical representation, and providing a parameter diagram graphical representation, wherein providing the graphical representations comprises providing a pictorial diagram of component interactions for one or more components comprising the system such that a visual display of the component interactions is provided to facilitate generating the FMEA form, and wherein the boundary diagram graphical representation is provided, the interface matrix diagram graphical representation is provided after providing the boundary diagram graphical representation and based in part upon the visual display provided by the boundary diagram graphical representation, and the parameter diagram graphical representation is provided after providing the boundary diagram graphical representation and the interface matrix diagram graphical representation such that each graphical representation builds upon the boundary diagram graphical representation to facilitate generating the FMEA form.

- [c19] 19. A computer-readable medium facilitate failure modes and effects analysis (FMEA) of one or more components of a system, wherein an FMEA form is generated to indicate the FMEA, the computer-readable medium programmed to:  
display a sequential order of completion of steps for a

number of graphical representations of component interactions which are to be completed by an FMEA analyst and received by the graphical user interface in sequential order to facilitate generating the FMEA form; and indicate whether the graphical representations are received according to the sequential order of completion.

- [c20] 20. The computer-readable medium of claim 19 programmed to receive a boundary diagram, an interface matrix diagram, a parameter diagram, and an interface checklist diagram.